Reaching for Resilience

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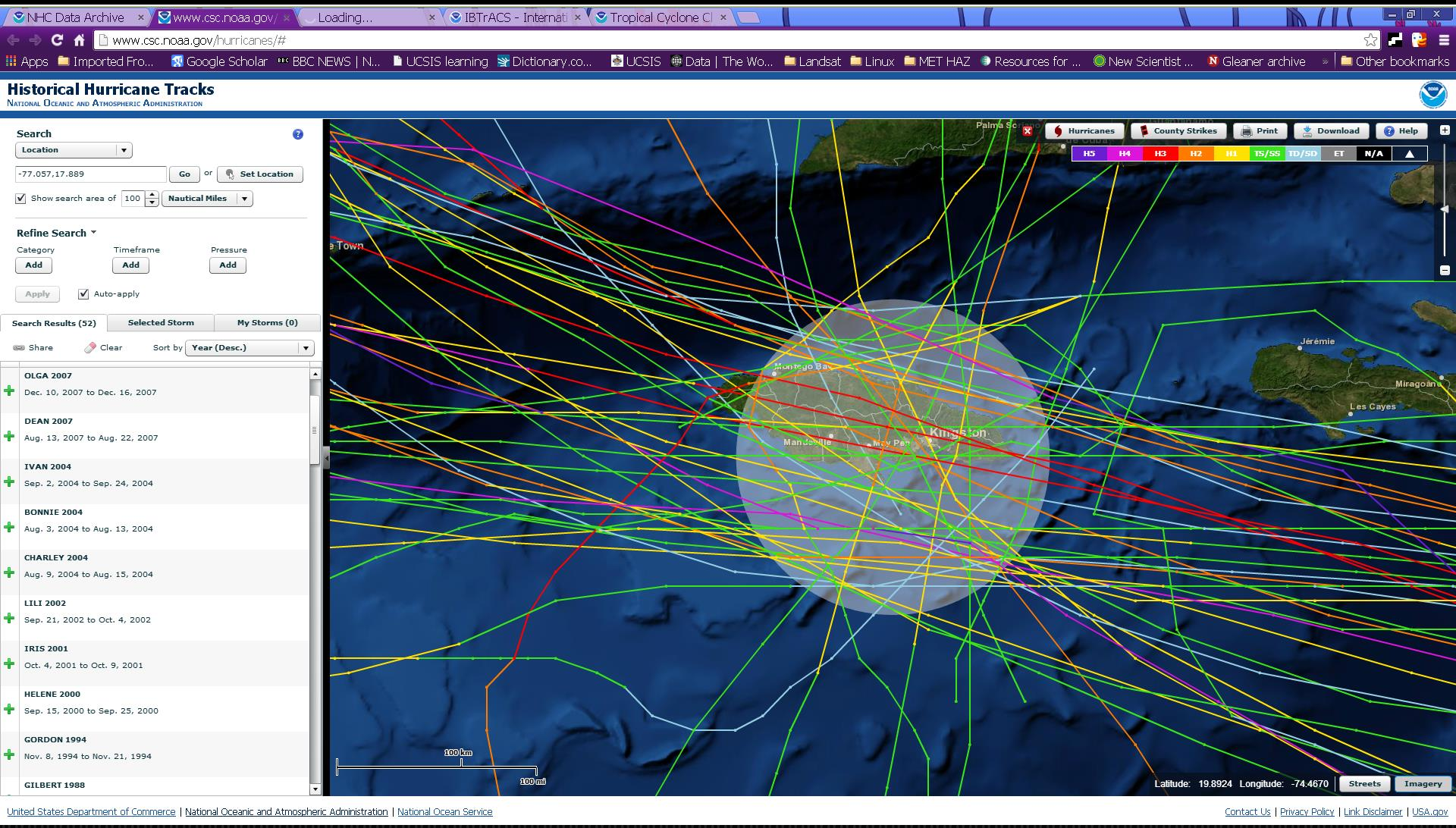
Cyclone tracks



Key risks/vulnerabilities/challenges -

- Climate Change
  - Changed rainfall patterns
  - Increased drought and floods
  - Fewer Hurricanes, but wetter and stronger
  - The Sea level will rise
  - The sea will become more acidic
  - This will probably happen in the tropics before the rest of the world. Early Climate Departure for the Caribbean region starting with Jamaica

Dependence of the economy on natural resources

- If beach erosion remains as it was in 2011, then over ten years, beaches in Negril, Montego Bay & Ocho Rios will lose value of **US$19 million *annually***.
- If reefs degrade more, increased erosion will increase the loss to **US$33 million**.
- Erosion could reduce visitation by 9,000 to 18,000 stopovers per year; costing the industry between **US$9 & US$19 million** annually and costing the entire economy between US$11 to US$23 million.

  - Kushner, B., P., Edwards, L. Burke, and E. Cooper. 2011. *Coastal Capital: Jamaica. Coral Reefs, Beach Erosion and Impacts to Tourism in Jamaica. Working Paper. Washington, DC: World Resources Institute.*

Ecological Economics

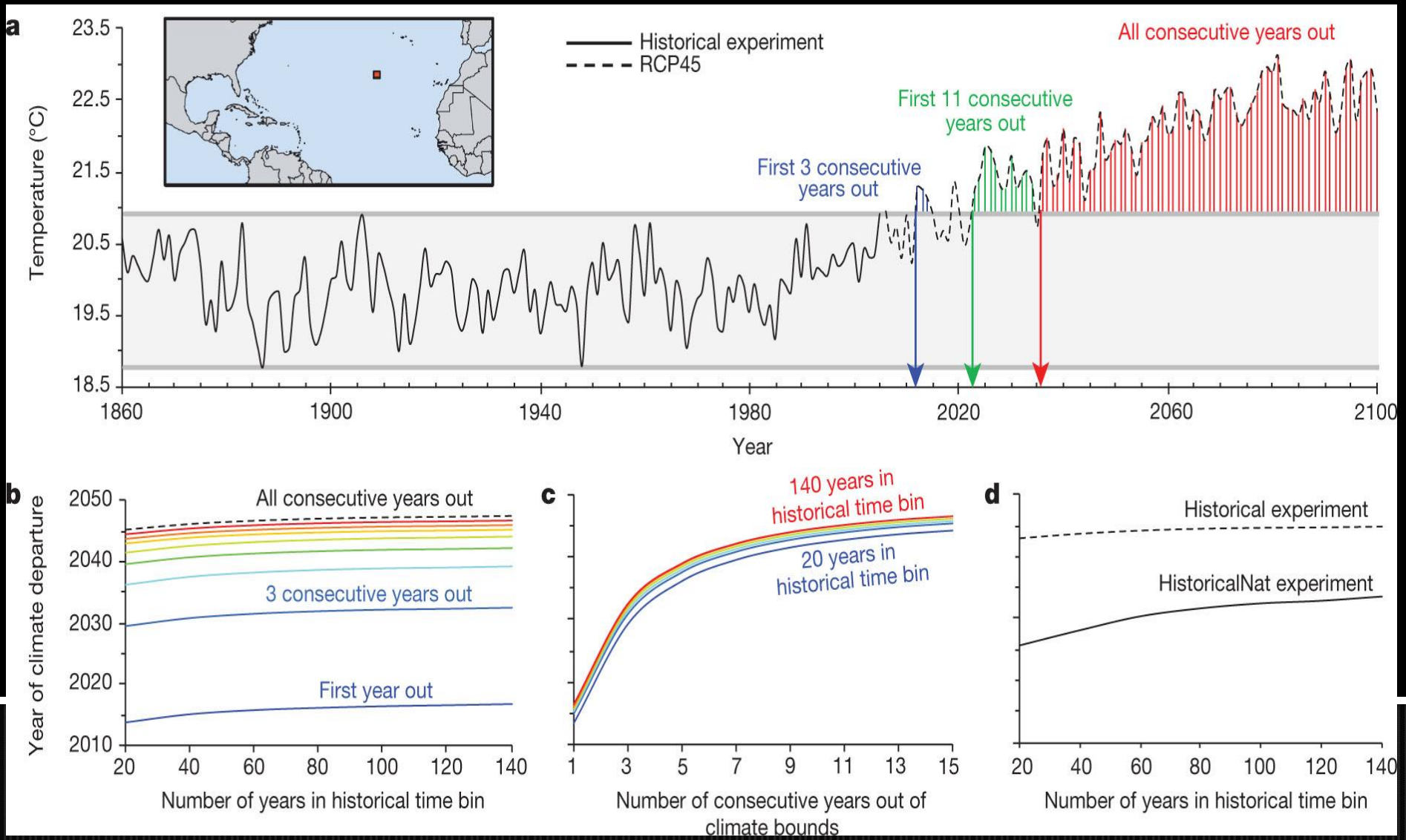
- **Species of economic importance**
  - Crops, pollinators, trees, food, pests, disease vectors
  - Coral Reefs, Mangroves, Seagrasses
- **Ecosystem Services**
  - High quality Water
  - White Sand
  - Landscapes and Seascapes
  - Land and Soils; provision & conservation
  - Nurseries for Fish
  - Conservation of coastline

But why worry?

- Why worry if it will be warmer by a few degrees C in 2100 or 2050?
- We should worry about the present
  - *"Global mean ocean pH moved outside its historical variability in 2008 (±3 years s.d.)*." Mora et. al.

Raven, J. A. et al. (eds). Ocean Acidification due to Increasing Atmospheric Carbon Dioxide (Royal Society, 2005).
Zeebe, R. E., Zachos, J. C., Caldeira, K. & Tyrrell, T. Carbon emissions and acidification. Science 321, 51–52 (2008).

Estimating the projected timing of climate departure.



C Mora *et al. Nature* **502,** 183-187 (2013) doi:10.1038/nature12540

Climate Departure: Results

- *Global* mean of 2047 (± 14 years s.d.) for near-surface air temperature with 'business-as-usual'. Since this is the mean about half the world will depart *before* 2047
- **Unprecedented climates will occur earliest in the tropics & low-income countries**,

How can we be sustainable?

- Nature:
  - Take care of the coast, the forests & the sea.
  - Find out the value of our resources
- Economy:
  - Energy – we need cheaper, *sustainable* sources & increased efficiency
  - Businesses should assess their risks & develop continuity plans
- Wellbeing:
  - Increase knowledge and improve training
- Society:
  - Improve physical planning & building techniques

What is ISD doing?

- Zero Energy Building
  - Generate more energy than it consumes
  - Be able to withstand major tropical cyclones
  - Multi-purpose building
  - A model to emulate the design, building use & management
- UCSIS degree
  - Working with other SIDS universities to produce online courses on Climate Change

What is ISD doing?

- Enhancing Knowledge and Application of Comprehensive Disaster Management (CDM)
  - Cataloguing hazards, Exposure & Vulnerability
  - Estimating Risk due to earthquakes
  - Producing material for Small and Medium sized enterprises (SMEs) to increase their resilience to disaster and climate risk

What is ISD doing?

- Working with the DOGG
  - Vulnerability of Livelihoods in tourism to CC
  - Helping to increase community resilience to floods
- Economic Valuation of Natural Resources
  - Estimating the economic values of Protected Areas
  - Advising Government of Jamaica on how to make economic valuation part of the Environmental Impact Assessment Process